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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/897,910	07/03/2001	Richard Stirling-Gallacher	450117-03250	1395

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NEW YORK, NY 10151

EXAMINER

DEAN, RAYMOND S

ART UNIT	PAPER NUMBER
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2684

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/897,910

Applicant(s)

STIRLING-GALLACHER ET AL.

Examiner

Raymond S Dean

Art Unit

2684

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 - 12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones IV et al. (US 6,487,253 B1) in view of Cimini Jr. et al. (US 6,327,314 B1).

Regarding Claim 1, Jones teaches a device for receiving signals in a wireless cellular orthogonal frequency division multiplex (OFDM) system (Column 2 lines 34 – 36), in which data symbols are transmitted in frequency sub-carriers and timeslots (Column 2 lines 36 – 40), comprising channel estimation means for performing a channel estimation on the basis of received pilot symbols (Column 3 lines 11 – 19), whereby the channel estimation for the data symbols between pilot symbols is performed by means of a filter selected on the basis of an interference reference value (Figure 3, Column 3 lines 46 – 53, the IFFT/interference block is the filter that is selected due to the fact that there is interference, said filter in conjunction with the zero pad create an optimal channel estimate that minimizes the interference for the burst, which comprises pilot (training) symbols and data symbols.).

Jones does not specifically teach a set of filters.

Cimini teaches a set of filters (Column 4 lines 62 – 66).

Jones and Cimini both teach a wireless OFDM system that uses channel estimation thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the set of filters taught in Cimini in the wireless OFDM system of Jones such that there will be a wireless OFDM system that adapts to the Doppler shift and multi-path delay spread that is in said wireless OFDM systems.

Regarding Claim 7, Jones teaches a method for channel estimation in a wireless cellular orthogonal frequency division multiplex (OFDM) system, in which data symbols are transmitted in frequency sub-carriers and timeslots (Column 2 lines 36 – 40), whereby channel estimation on the basis of received pilot symbols is performed (Column 3 lines 11 – 19), whereby the channel estimation for the data symbols between pilot symbols is performed by means of a filter selected on the basis of an interference reference value (Figure 3, Column 3 lines 46 – 53, the IFFT/interference block is the filter that is selected due to the fact that there is interference, said filter in conjunction with the zero pad create an optimal channel estimate that minimizes the interference).

Jones does not specifically teach a set of filters.

Cimini teaches a set of filters (Column 4 lines 62 – 66).

Jones and Cimini both teach a wireless OFDM system that uses channel estimation thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the set of filters taught in Cimini in the wireless OFDM system of Jones such that there will be a wireless OFDM system that adapts to the Doppler shift and multi-path delay spread that is in said wireless OFDM systems.

3. Claims 2 - 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones IV et al. (US 6,487,253 B1) in view of Cimini Jr. et al. (US 6,327,314 B1) and in further view of Ramesh (US 6,463,105 B1).

Regarding Claim 2, Jones in view of Cimini teaches all of the claimed limitations recited in Claim 1. Jones in view of Cimini does not specifically teach a carrier to interference ratio.

Ramesh teaches a carrier to interference ratio (Column 3 lines 25 – 37).

Jones in view of Cimini and Ramesh teach a wireless communication system where the receiver uses the least squares method for channel estimation in a multi-path environment thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the carrier to interference ratio taught in Ramesh in the wireless communication system of Jones in view of Cimini for the purposes of providing improved estimates of said carrier to interference ratio for channels subject to multi-path fading effects.

Regarding Claim 3, Jones in view of Cimini and in further view of Ramesh teaches all of the claimed limitations recited in Claim 2. Jones further teaches a frequency sub-carrier and timeslot of the data symbol to be channel estimated (Figure 3, Column 2 lines 34 – 40, Column 3 lines 46 – 53, this is an OFDM system that uses channel estimation thus the IFFT/interference in conjunction with the zero pad create an optimal channel estimate that minimizes the interference for a frequency sub-carrier and timeslot of the data symbol).

Regarding Claim 4, Jones in view of Cimini and in further view of Ramesh teaches all of the claimed limitations recited in Claim 2. Jones further teaches a wanted carrier power value at the frequency sub-carrier and the timeslot of the data symbol to be channel estimated (Figure 3, Column 2 lines 34 – 40, Column 3 lines 46 – 53, this is an OFDM system that uses channel estimation thus the IFFT/interference in conjunction with the zero pad create an optimal channel estimate that minimizes the interference for a frequency sub-carrier and timeslot of the data symbol, this means that the carrier power will increase, which is a desired characteristic).

Regarding Claim 5, Jones teaches all of the claimed limitations recited in Claim 3. Cimini further teaches a frequency filter that is selected on the basis of a difference vector between frequency sub-carriers adjacent to the frequency sub-carrier of the data symbol to be channel estimated (Column 4 lines 57 – 59, Column 4 lines 62 – 63, the delay spread coupled with the inherent windowing of the FFT processing will cause the adjacent sub-carriers to interfere with each other (inter-channel interference) which means that the frequency difference between said adjacent sub-carriers will vary with said delay spread thus there will be an inherent difference vector).

Regarding Claim 6, Jones teaches all of the claimed limitations recited in Claim 3. Cimini further teaches a time filter that is selected on the basis of a Doppler frequency of the estimated channel (Column 4 lines 55 – 57, Column 4 lines 62 – 63).

Regarding Claim 8, Jones in view of Cimini teaches all of the claimed limitations recited in Claim 7. Jones in view of Cimini does not specifically teach a carrier to interference ratio.

Ramesh teaches a carrier to interference ratio (Column 3 lines 25 – 37).

Jones in view of Cimini and Ramesh teach a wireless communication system where the receiver uses the least squares method for channel estimation in a multi-path environment thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the carrier to interference ratio taught in Ramesh in the wireless communication system of Jones in view of Cimini for the purposes of providing improved estimates of said carrier to interference ratio for channels subject to multi-path fading effects.

Regarding Claim 9, Jones in view of Cimini and in further view of Ramesh teaches all of the claimed limitations recited in Claim 8. Jones further teaches a frequency sub-carrier and timeslot of the data symbol to be channel estimated (Figure 3, Column 2 lines 34 – 40, Column 3 lines 46 – 53, this is an OFDM system that uses channel estimation thus the IFFT/interference in conjunction with the zero pad create an optimal channel estimate that minimizes the interference for a frequency sub-carrier and timeslot of the data symbol).

Regarding Claim 10, Jones in view of Cimini and in further view of Ramesh teaches all of the claimed limitations recited in Claim 8. Jones further teaches a wanted carrier power value at the frequency sub-carrier and the timeslot of the data symbol to be channel estimated (Figure 3, Column 2 lines 34 – 40, Column 3 lines 46 – 53, this is an OFDM system that uses channel estimation thus the IFFT/interference in conjunction with the zero pad create an optimal channel estimate that minimizes the interference for

a frequency sub-carrier and timeslot of the data symbol, this means that the carrier power will increase, which is a desired characteristic).

Regarding Claim 11, Jones teaches all of the claimed limitations recited in Claim 9. Cimini further teaches a frequency filter that is selected on the basis of a difference vector between frequency sub-carriers adjacent to the frequency sub-carrier of the data symbol to be channel estimated (Column 4 lines 57 – 59, Column 4 lines 62 – 63, the delay spread coupled with the inherent windowing of the FFT processing will cause the adjacent sub-carriers to interfere with each other (inter-channel interference) which means that the frequency difference between said adjacent sub-carriers will vary with said delay spread thus there will be an inherent difference vector).

Regarding Claim 12, Jones teaches all of the claimed limitations recited in Claim 9. Cimini further teaches a time filter that is selected on the basis of a Doppler frequency of the estimated channel (Column 4 lines 55 – 57, Column 4 lines 62 – 63).

Conclusion

4. Any inquiry concerning this communication should be directed to Raymond S. Dean at telephone number (703) 305-8998.

If attempts to reach examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung, can be reached at (703) 308-7745. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

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Or faxed to:

(703) 872-9314 (for Technology center 2600 only)

Hand – delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist). Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377

A large, stylized handwritten signature in black ink, appearing to read "Raymond Lee".A small, stylized handwritten signature in black ink, appearing to read "Nay Maung".
NAY MAUNG
SUPERVISORY PATENT EXAMINER